

Low evaporation rate storage media for cryogenic liquids, Phase I

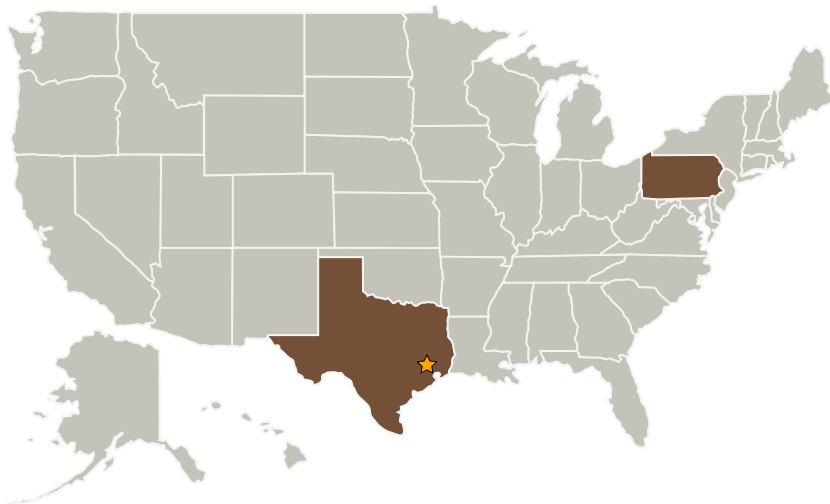
Completed Technology Project (2004 - 2004)



Project Introduction

Considerable design work has been devoted to the development of cryogenic liquid storage containers. Containers which hold cryogenic liquids such as liquid nitrogen, oxygen, hydrogen, etc. often are double walled vacuum insulated or super insulation flasks, bottles or tanks. Vessels so designed for space applications have the lowest cryogen evaporation rates of any available, but research is ongoing to render these containers less permeable to heat flux. We propose a different approach to increasing the cryogenic liquid hold time. We propose increasing the heat needed to drive off the cryogenic liquid by fundamentally changing the heat needed to cause evaporation of the cryogenic liquid. Our unique approach should not be confused with technology developed to support cryogenics during shipping or other mechanical gyrations, exploits the unique physics and chemistry of nanomaterials and their interaction with the cryogenic liquid. Successful development of the proposed technology will result in longer hold times, decreased payload mass, lower volume, increased safety and decreased energy utilization.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
NanoMaterials Company	Supporting Organization	Industry	Malvern, Pennsylvania



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations

Pennsylvania

Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Nicholas V Coppa

Technology Areas

Primary:

- TX01 Propulsion Systems
 - └ TX01.1 Chemical Space Propulsion
 - └ TX01.1.3 Cryogenic